

- XXXII. HAUGHTON.—“*Meles taxus*.” P. R. I. A. vol. ix. p. 507.
- XXXIII. CUVIER & LAURILLARD.—“Le Blaireau d'Europe.” Planches de Myologie, Pls. 100-103.
- XXXIV. HAUGHTON.—“*Lutra vulgaris*.” P. R. I. A. vol. ix. p. 511.
- XXXV. CUVIER & LAURILLARD.—“La Loutre.” Planches de Myologie, Pls. 108-111.
- XXXVI. LUCÆ.—“*Lutra vulgaris*.” Abhandl. d. Senckenb. Gesellschaft, Bd. ix.
- XXXVII. MACALISTER.—“*Aonyx leptonyx*.” P. R. I. A. vol. i., n. ser. p. 539.
- XXXVIII. DIECK.—“*Canis vulpes*.” Zeitschr. f. d. gesammte Naturwiss. Bd. xxxi. p. 218.
- XXXIX. MECKEL.—‘Anatomie Comparée.’ Tome vi.
- XL. PAGENSTECHEK.—“*Lycaon pictus*.” Zoologischer Garten, Jahrg. 1870, p. 238.
- XLI. PARSONS.—“Myology of Rodents.” P. Z. S. 1894, p. 251.
- XLIIa. PARSONS.—“Myology of Rodents.” P. Z. S. 1896, p. 159.
- XLII. PARSONS.—Possible Sternalis in *Bathyergus*.” P. Anat. Soc., Feb. 1895, p. xi.
- XLIII. GILIS.—“Anatomy of Scalenes in Ruminants, Solipeds, and Carnivora.” Comptes Rendus, ser. 9, tome iv. no. 20, p. 464.
- XLIV. WINDLE.—“Deep flexor mass of the Forearm.” Journ. Anat. vol. xxiv. p. 72.
- XLV. WINDLE.—“Adductor Muscles of the Hand.” P. Birm. Phil. Soc. vol. v. pt. 2, no. 12.
- XLVI. CUNNINGHAM.—“Report on the Marsupialia.” Challenger Reports, vol. v. part 16, p. 19.
- XLVII. WINDLE.—“Pectoral Group of Muscles.” Trans. R. I. Acad. xxix. p. 345.

2. Note upon the Minute Structure of the Teeth of
Notoryctes. By CHARLES S. TOMES, M.A., F.R.S.

[Received February 11, 1897.]

So far as I know no description of the minute structure of the teeth of this remarkable marsupial has been published. Dr. Stirling has been so kind as to send me a fragment of a jaw containing three teeth. From these I have been able to make two sections, which present some points that seem worth recording.

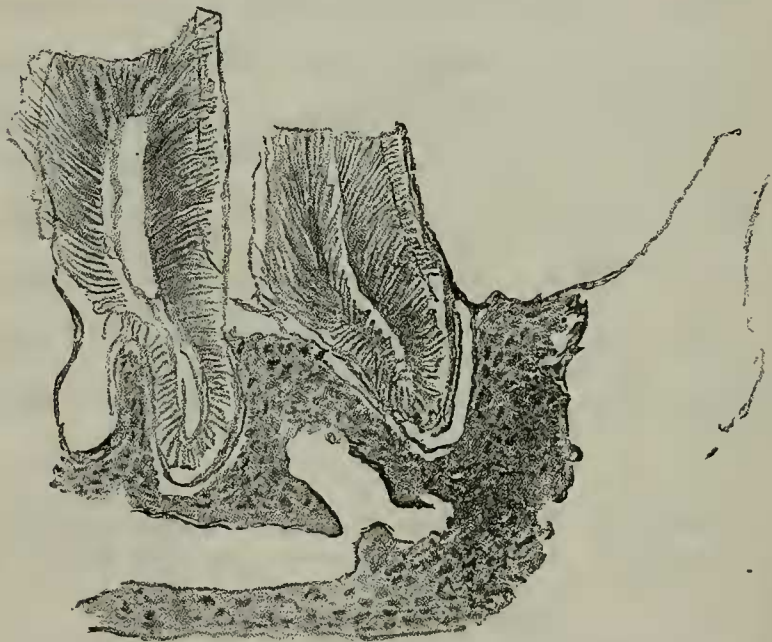
Dr. Stirling, in his original memoir (Trans. Roy. Soc. South Australia, 1891), described the naked-eye characters of these teeth; and Dr. Gadov subsequently (Proc. Zool. Soc. 1892) further investigated them, stating that the teeth were of the “zoophagous

marsupial plan." This is to a certain extent true; but yet they differ from all other teeth with which I am acquainted, and they are interesting in respect of the question of the food of this creature, which is unfortunately not known with exactitude. Dr. Stirling found the remains of ants in the digestive tract; but in confinement these animals would not eat ants, though one did eat a large soft grub, the larval form of a longicorn beetle, or perhaps of a lepidopterous insect, and another ate a piece of bread. The structure of the teeth would seem to indicate that its food is not very hard.

In Dr. Stirling's figures of the grinding-surfaces of the molar teeth it is shown that the middles are worn into concavities, and that the retention of the cuspidate form is not due to the persistence of the sharp enamelled cusps, as is the case in Insectivora generally, but that it is due to the upstanding of the edges.

This is well seen in the drawing (fig. 1), which shows the enamel absent (*i. e.* worn through) on the masticating surfaces, but remaining and projecting a little all round the circumference of the tooth, so that an area of dentine surrounded by an upstanding ring of

Fig. 1.



The last two lower molars of *Notoryctes*, *in situ*, $\times 14$; the ascending piece of bone to the right of the figure is a portion of the coronoid process. In the front of the two teeth the pulp-cavity still persists, in the other it is apparently nearly obliterated. Two obsolete vascular canals are to be seen near the surface of the dentine.

enamel is used for mastication. This condition of severe wear appears not to be very common in insectivorous mammals, whose teeth generally long retain their enamel and bristling cusps; but it may be seen in old specimens of *Perameles* and in some true

Insectivora—usually, however, in specimens hidden away in store, as not good for display in the cases of a museum, so that, until I specially looked up this point, I was under the impression that great wear of the molars was more uncommon than it really is. The cusps of the teeth in young specimens are, of course, covered by enamel.

It seems probable, at all events in the case of *Notoryctes*, that the wearing-down of the teeth is due to sand, in which the animal is perpetually burrowing, being taken in with the food, rather than to the hardness of the food itself; for the feeble implantation of the teeth militates against the idea that they are put to very hard work.

In *Notoryctes* only about one third, even of the worn tooth, is implanted in a socket, whereas most Insectivora have very long and firmly implanted roots to their teeth; as, however, the sections are not exactly in the axis of the middle of the teeth, the roots may be a little, though not very much, longer than they appear.

The occurrence of obsolete vascular canals near the worn surface of the left-hand tooth (as seen in fig. 1, p. 410) is an indication, so far as it goes, that these teeth come into wear before their growth is complete, and that the roots are only formed late; such obliterated vascular canals are very common in the axis of the worn teeth of rodents, especially of their incisors, in which the dentine forms a large share of the masticating surface, and the enamel only fulfils the function of keeping the edge sharp.

In 1849 my father described (Phil. Trans.) the penetration of the enamel by the dentinal tubes as a character common to all Marsupials, with the exception of the Wombat, though the extent to which it takes place varies much in different members of the group. This character is not peculiar to the Marsupials, as it occurs in a good many Insectivora, and occasionally, though rarely, in other Placental mammals, as for example in the Hyrax.

Fig. 2.



A portion of dentine and enamel from the anterior tooth of *Notoryctes*, more highly magnified. The dentine lies to the left in the figure.

In the *Macropodidæ* the tubes pass across in very great abundance, there being a marked dilatation at the junction of the enamel

and the dentine, while the tubes in the enamel are straight and regular.

In *Dasyuridæ* they pass across more sparsely, as is the case also in *Didelphyidæ*, and no dilatation takes place at the passage, but there is an abrupt bend at this point.

In *Notoryctes* (fig. 2, p. 411) this marsupial character is very strongly marked; the tubes pass into, and through almost the whole thickness of, the enamel in great abundance: they show no dilatation, but a very strongly marked bending at the point of passage. They have another peculiarity: when in the enamel they often show several sharp abrupt bends, the concavities of which lie towards the grinding surface, but they resume sooner or later their original direction parallel with the enamel prisms.

This character also is met with in *Thylacinus* and markedly in *Didelphys*, but is not to be found in Macropods; hence in this feature of minute structure a point of resemblance with *Didelphys* is shown.

It is interesting to find in these points of minute structure some confirmation of the correctness of the view, arrived at on quite different grounds, that *Notoryctes* has affinities with the *Dasyuridæ* and *Didelphyidæ*.

3. The Blue Bear of Tibet, with Notes on the Members of the *Ursus arctus* Group. By R. LYDEKKER, F.R.S., F.Z.S.

[Received February 17, 1897.]

(Plate XXVII.)

In the year 1853 the late Edward Blyth¹ gave a brief notice of the imperfect skin of a Bear from Tibet, obtained by Dr. A. Campbell, and now preserved in the Indian Museum, Calcutta. He regarded it as probably referable to a variety of the Himalayan Black Bear (*Ursus torquatus*), but suggested that if it proved specifically distinct, the Tibetan Blue Bear, as Dr. Campbell called it, might be known as *U. pruinosus*. As Mr. Blanford subsequently pointed out, this title is little more than a *nomen nudum*, and the name apparently dates from the description of a skin and imperfect skull described by the latter writer². These specimens were brought to the late Mr. Mandelli at Darjiling by a native who stated that he had purchased them at Lhasa, and that the animal inhabited the plains around that city. This skin and skull are likewise in the Indian Museum.

Mr. Blanford considered that the skin obtained by Mr. Mandelli was specifically identical with Blyth's Blue Bear of Tibet, and he accordingly described it as a distinct species, under the name of *U. pruinosus*; his description being as follows:—

“The general coloration above is tawny brown, palest on the

¹ Journ. Asiat. Soc. Bengal, vol. xxii. p. 589 (1853).

² Ibid. vol. xlvi. p. 318 (1877).